

CLAIMS

1. A temperature control device used for an electronic device testing apparatus for conducting a test on an 5 electronic device to be tested by sending a test pattern to the electronic device to be tested and detecting a response pattern thereto, comprising:

a temperature adjusting device provided to contact with said electronic device to be tested; and

10 a power control means for controlling power consumption of said temperature adjusting device, so that total power of a power consumption of said electronic device by said test pattern and a power consumption of said temperature adjusting device becomes a constant value.

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2. The temperature control device as set forth in claim 1, wherein said power control means comprises

20 a power consumption pattern prediction portion for predicting a power consumption pattern in said electronic device to be tested from a test pattern transmitted to said electronic device;

25 a power consumption canceling pattern generation portion for generating a power consumption canceling pattern for canceling a power consumption pattern in said electronic device to be tested; and

a power consumption canceling pattern transmission portion for sending said power consumption canceling pattern to said temperature adjusting device.

30 3. The temperature control device as set forth in claim 1,

wherein said power control means comprises

5 a first power supply means which is one of parallel lines branched from a constant current supply means for supplying a constant current, for supplying a current to said electronic device to be tested; and

a second power supply means which is the other parallel line branched from said constant current supply means, for supplying a current to said temperature adjusting device.

10 4. The temperature control device as set forth in any one of claims 1 to 3, wherein temperature change characteristics by a power consumption of said temperature adjusting device are equal to or close to those by a power consumption of said electronic device to be tested.

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5. The temperature control device as set forth in claim 4, wherein a heat capacity of said temperature adjusting device is equal to or close to that of said electronic device to be tested.

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6. A temperature control method for conducting a test on an electronic device to be tested by transmitting a test pattern to said electronic device to be tested and detecting a response pattern thereto, comprising the steps of:

25 bringing a temperature adjusting device to said electronic device to be tested; and

controlling a power consumption of said temperature adjusting device, so that a total power of a power consumption of said electronic device to be tested and a power consumption of said temperature adjusting device becomes a constant value.

7. The temperature control method as set forth in claim 6, wherein said step for controlling the power consumption comprises steps of

5 predicting a power consumption pattern in said electronic device to be tested from a test pattern transmitted to said electronic device to be tested;

generating a power consumption canceling pattern for canceling a power consumption in said electronic device to be 10 tested; and

transmitting said power consumption canceling pattern to said temperature adjusting device.

8. The temperature control method as set forth in claim 6, 15 wherein said step for controlling the power consumption comprises the steps of

supplying a current to said electronic device to be tested by branching to one of parallel lines from a constant current supply means for supplying a constant current; and

20 supplying a current to said temperature adjusting device by branching to the other parallel line from said constant current supply means.

9. An electronic device testing handler, comprising:

25 a pusher for pressing an electronic device to be tested against a contact terminal, to which a test pattern is input; and

a temperature adjusting device provided to said pusher so as to contact with said electronic device to be tested;

30 wherein a power consumption of said temperature adjusting

device is controlled, so that total power of a power consumption of said electronic device to be tested by said test pattern and a power consumption of said temperature adjusting device becomes a constant value.

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10. An electronic device testing apparatus, comprising:

a test pattern generation means for generating a predetermined test pattern;

a test pattern transmission means for transmitting a test

10 pattern generated by said test pattern generation means to a contact terminal, against which a terminal of an electronic device to be tested is pressed;

a determination means for evaluating said electronic device to be tested based on a response pattern to said test 15 pattern; and

a power control means for controlling a power consumption of said temperature adjusting device, so that total power of a power consumption of said electronic device to be tested by said test pattern and a power consumption of a temperature 20 adjusting device provided for contacting with said electronic device to be tested becomes a constant value.

11. The electronic device testing apparatus as set forth in claim 10, wherein said power control means comprises:

25 a power consumption pattern prediction portion for predicting a power consumption pattern in said electronic device to be tested from a test pattern transmitted to said electronic device to be tested;

30 a power consumption canceling pattern generation portion for generating a power consumption canceling pattern for

canceling a power consumption pattern in said electronic device to be tested; and

5 a power consumption canceling pattern transmission portion for transmitting said power consumption canceling pattern to said temperature adjusting device.

12. The electronic device testing apparatus as set forth in claim 10, wherein said power control means comprises

10 a first power supply means which is one of parallel lines branched from a constant current supply means for supplying a constant current, for supplying a current to said electronic device to be tested; and

15 a second power supply means which is the other parallel line branched from said constant current supply means, for supplying a current to said temperature adjusting device.

13. An electronic device testing method for conducting a test on an electronic device to be tested by transmitting a predetermined test pattern to said electronic device to be tested via a contact terminal and detecting a response pattern thereto in a state of pressing a terminal of said electronic device to said contact terminal, comprising the steps of:

25 bringing a temperature adjusting device contact with said electronic device to be tested;

 controlling a power consumption of said temperature adjusting device, so that total power of a power consumption of said electronic device to be tested by said test pattern and a power consumption of said temperature adjusting device becomes a constant value; and

30 evaluating said electronic device to be tested based on a

response pattern to said test pattern.

14. A temperature control device used in an electronic device testing apparatus for conducting a test on an electronic device to be tested by transmitting a test pattern to said electronic device to be tested and detecting a response pattern thereto, comprising:

a heater for dynamically heating said electronic device to be tested;

10 a cooler made by a peltiert element for cooling or heating said electronic device to be tested; and

a heat sink connected thermally to said cooler, for cooling or heating a heat release surface of said cooler.

15 15. The temperature control device as set forth in claim 14, for dynamically controlling heating power of said heater based on a power consumption of an electronic device to be tested by said test pattern.

20 16. The temperature control device as set forth in claim 14, for generating a power consumption canceling pattern based on a signal from a temperature sensing element provided to said electronic device to be tested and dynamically controlling heating power of said heater.

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17. The temperature control device as set forth in claim 14, for controlling cooling or heating of said cooler based on a signal from a temperature sensing element provided to said electronic device to be tested.

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18. The temperature control device as set forth in claim 14,
comprising

5 a first control means for performing feedback control on
cooling power of said cooler based on a signal from a
temperature sensing element provided to said electronic device
to be tested; and

a second control means for performing feedforward control
on heating power of said heater based on a power consumption
of the electronic device to be tested by said test pattern.

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19. An electronic device testing apparatus for conducting a
test on an electronic device by transmitting a test pattern to
said electronic device to be tested and detecting a response
pattern thereto, comprising:

15 a temperature control device as set forth in any one of
claims 14 to 18;

a pusher for pressing an electronic device to be tested
against a contact terminal, to which a test pattern is input;
and

20 a cooler made by a peltiert element provided to said
pusher so as to dynamically contact with said electronic
device to be tested, for cooling or heating said electronic
device to be tested.

25 20. The electronic device testing apparatus as set forth in
claim 19, wherein said temperature control device generates a
power consumption canceling pattern based on a power
consumption of an electronic device to be tested by said test
pattern and dynamically controlling heating power of said
30 heater.

21. The electronic device testing apparatus as set forth in
claim 19, wherein said temperature control device dynamically
controls heating power of said heater based on a signal from a
5 temperature sensing element provided to said electronic device
to be tested.

22. The electronic device testing apparatus as set forth in
claim 19, wherein said temperature control device controls
10 cooling or heating of said cooler based on a signal from a
temperature sensing element provided to said electronic device
to be tested.

23. The electronic device testing apparatus as set forth in
15 claim 19, wherein said temperature control device generates a
power consumption canceling pattern at a prior stage at
predetermined early time based on a power consumption of an
electronic device to be tested by said test pattern and heat
transfer time for reaching to inside of said electronic device
20 to be tested and dynamically controls heating power of said
heater.

24. The electronic device testing apparatus as set forth in
claim 19, wherein said temperature control device performs
25 differential addition or subtraction on heating power of said
heater based on a temperature change amount of a signal from a
temperature sensing element provided to said electronic device
to be tested.